

REMARKS

In the Office Action of August 5, 2005, the Examiner rejected claims 37-73 and 86-111. This response amends claims 37, 45, 50, 65, 86, 90, 93-94, 100, and 107. Reconsideration of this application is respectfully requested.

Rejections—35 U.S.C. § 112

The Office rejected claims 37-46, 50-64, and 90-92 under 35 U.S.C. § 112, first paragraph as failing to comply with the written description requirement.

With respect to claim 37 and claims 38-46 which depend from claim 37, the Office suggested the term “an identical sequence of semiconductor layers.” Applicants have so amended claim 37 and respectfully request the removal of this rejection.

The Office also asserts that the “substantially the same thickness” limitation is not supported by the specification. Applicants respectfully disagree. In the application as filed, figures 3-5 and the text describing those figures (from page 8, line 23 to page 11, line 19) describes how the bypass device is constructed by etching a solar cell to create a bypass device and a solar cell in a single semiconductor structure. A single semiconductor structure is etched to create two different, spaced apart devices on the semiconductor substrate. Therefore, inherent in the manufacturing process is the fact that the layers of the bypass device have substantially the same composition and thickness as the subcell since the bypass device and the subcell were formed from the sequence of layers or semiconductor structure before etching and the composition and thickness of the remaining layers is not changed by the etching. Applicants respectfully request the removal of this rejection.

The Office asserts that the requirement in claim 47 that the top layer of the top cell have a first polarity and the bottom layer of the bypass diode have said first polarity is not supported by the specification. Applicants respectfully traverse this rejection. With reference to Figure 8, the top layer of the top cell is n-type window layer 846 (see page 16, lines 24-28). The bottom layer of the bypass diode is n-type layer 860 (see page 17, lines 9-11). Therefore, the bottom layer of the bypass diode and the top layer of the top cell both have the same polarity, in this embodiment, "n-type." Applicants respectfully request the removal of this rejection.

The Office asserts that the limitation, "as least in part" in claim 45 is not supported by the specification. Applicants respectfully traverse this rejection. With reference to Figure 1, the top layer of the middle cell is shown as InGaP. Applicants respectfully request the removal of this rejection.

The Office asserts that the limitation, "as least in part" in claim 46 is not supported by the specification. Applicants respectfully traverse this rejection. With reference to Figure 1, the buffer layer of the bottom cell is shown as GaAs. Applicants respectfully request the removal of this rejection.

The Office asserts that claims 50-64 are not supported by the specification. Applicants traverse this rejection for the same reasons listed above with respect to claims 37-46 and respectfully request the removal of this rejection.

The Office asserts that the requirement in claim 90 that the top layer of the top cell have a first polarity and the bottom layer of the bypass diode have said first polarity is not supported by the specification. Applicants respectfully traverse this rejection. With reference

to Figure 8, the top layer of the top cell is n-type window layer 846 (see page 16, lines 24-28). The bottom layer of the bypass diode is n-type layer 860 (see page 17, lines 9-11). Therefore, the bottom layer of the bypass diode and the top layer of the top cell both have a first polarity. Applicants respectfully request the removal of this rejection.

The Office asserts that the phrase, “at least one layer” in claim 90 is not supported by the specification. Applicants respectfully traverse this rejection. As shown in Figure 8, bypass diode 620 comprises, *inter alia*, elements 860, 862, and 864. Applicants assert that each of elements 860, 862, and 864 comprise a layer. Therefore, the bypass diode comprises “at least one layer.” Applicants respectfully request the removal of this rejection.

The Office rejected claims 37-46, 50-64, and 94 under 35 U.S.C. § 112, second paragraph as “being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.” The Office states that it is not clear what is to be encompassed by the term “substantially the same thickness.” Applicants assert that the term “substantially the same thickness” refers to the fact that each layer in the sequence of semiconductor layers in the bypass device and have the same composition and thickness as the corresponding layer in the subcell. Applicants assert that the claims as amended have clarified this relationship and respectfully request the removal of this rejection.

Rejections—Boutros reference

The Office rejected claims 47-49, 90-93, 95-98, 107, and 110 under 35 U.S.C. § 102(e) as being anticipated by Boutros (U.S. Patent 6,635,507). Applicants respectfully traverse this rejection.

In addition to the reasons listed in our previous response of May 20, 2005 (which are hereby incorporated by this reference), Applicants wish to point out that the integral bypass diode in Boutros protects an adjacent semiconductor cell, NOT the same cell on which the bypass diode is integrated. *See, e.g.*, Col. 6, line 56 to Col. 7, line 12; and Figure 5 of Boutros. Thus, if there was not an array of cells, but only one solar cell, the bypass diode of Boutros would not be connected to that solar cell, and thus the bypass diode disclosed in Boutros would not function to protect the sole solar cell

In contrast, the present invention is distinguished from Boutros by claiming a bypass diode that protects the *same* semiconductor cell which it is fabricated with in the same semiconductor body. For example, claim 47 recites that the integral bypass diode protects “said sequence of cells.” In other words, the integral bypass diode of claim 47 protects the solar cell that is constructed in the same integral semiconductor structure as the bypass diode. Similarly, claim 90 recites a bypass diode that protects “said multijunction solar cell,” again referring to the bypass diode protecting the solar cell in the same structure. Similarly, claim 107 recites a bypass diode that protects “said cell” and not merely “a cell” remote and separate from the bypass diode to which it may be electrically coupled with.

Applicants assert that Boutros fails to anticipate claims 47-49, 90-93, 95-98, 107, and 110 and respectfully request the removal of this rejection.

The Office rejected claims 47-68, 70, and 86-111 under 35 U.S.C. § 103(a) as being unpatentable over Boutros. Applicants traverse this rejection for the reasons stated above with respect to the section 102 rejections based on Boutros.

Rejections—JP ‘397 Reference

The Office rejected claims 37-41, 43-44, 47-48, 65-66, 68-69, 86-87, 89-91, 93, 95, 97-101, 103, 104, and 106-108 under § 102(b) as being anticipated by JP 9-64397 (“‘397 reference”).

The Office stated that Applicant’s arguments of 5/20/2005 were not persuasive. Applicants previously argued that the present invention recites a bypass device and a subcell that have identical sequence of layers with substantially the same thickness. The Office responded by stating that the ‘397 reference has transparent electrode (107) followed by collection electrode (108), which the Office asserts is the same sequence as in the bypass diode, which has transparent electrode (107D) followed by collection electrode (108D). Applicants respectfully traverse this rejection.

Applicants assert that, in order for a reference to satisfy the requirement for “an identical sequence of layers,” it must have the same number of layers in both the solar cell and the bypass diode. Moreover, it must have the same layers and the same number of layers in both the solar cell and the bypass diode and the layers must have the same composition and thickness. The ‘397 reference fails to meet either requirement.

The figure in the ‘397 reference shows a solar cell with layers numbered 107, 106B, 105B, 104B, 106A, 105A, and 104A. The bypass diode in the ‘397 reference shows layers numbered 108D, 107D, 104D, and 105D. Thus, there is no layer that corresponds to layer 106 in the bypass diode. In addition, the solar cell shows seven different layers, while the bypass diode only shows 4 different layers. Therefore, the bypass diode and the solar cell of the ‘397 reference do not have an identical sequence of semiconductor layers where each layer in the

solar cell has the same composition and thickness as the corresponding layer in the bypass diode.

Applicants respectfully request the removal of this rejection.

Rejections—Ho

The Office rejected claims 47-57, 59, 61, 65-68, 70, 86-111 under § 102(b) as being anticipated by Ho et al., WO 99/62125.

Claim 47 recites that the top cell of the top layer has the same polarity as the bottom layer of the bypass diode has the same polarity. In contrast, the top layer (1426) of the top cell of Ho is positive and the bottom layer of the bypass diode (1410) is negative. *See* Figure 14B. Therefore, Applicants assert that Ho does not anticipate claim 47 of the present invention.

Claim 50 has been amended to contain the above limitation with respect to polarity. Therefore, Applicants assert that Ho anticipates neither claim 50 of the present invention nor any of the claims which depend from claim 50.

Claim 65 has been amended to contain the above limitation with respect to polarity. Therefore, Applicants assert that Ho anticipates neither claim 65 of the present invention nor any of the claims which depend from claim 65.

Claim 90 contains the above limitation with respect to polarity. Therefore, Applicants assert that Ho anticipates neither claim 90 of the present invention nor any of the claims which depend from claim 90.

Claim 93 has been amended to contain the above limitation with respect to polarity.
Therefore, Applicants assert that Ho anticipates neither claim 93 of the present invention nor any of the claims which depend from claim 93.

Claim 100 has been amended to contain the above limitation with respect to polarity.
Therefore, Applicants assert that Ho anticipates neither claim 100 of the present invention nor any of the claims which depend from claim 100.

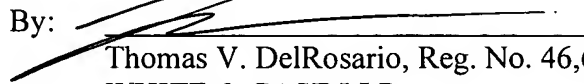
CONCLUSION

If there are any additional charges concerning this response, please charge to White & Case LLP Deposit Account 23-1703.

A favorable consideration of the present amendment together with the original application is respectfully requested.

Respectfully submitted,

Dated: November 4, 2005

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